

## CLAIMS:

1. Recordable optical record carrier for recording information using a radiation beam having wavelength  $\lambda$  and incident on an entrance surface of the optical record carrier comprising, in this order:
  - a protective layer facing the entrance surface,
  - 5       - a first recording stack (L0), said recording stack comprising a recording layer of an organic dye material and a groove structure,
  - a transparent spacer layer sandwiched between neighboring recording stacks, and
  - a second recording stack (LN) comprising a recording layer,
- 10   wherein the groove depth of the recording layer of the first recording stack (L0) is in a range from  $0.241 \cdot \lambda / n_s$  to  $0.362 \cdot \lambda / n_s$ , where  $n_s$  is a refractive index of a material in a land between grooves on the groove structure.
2. Record carrier according to claim 1, wherein the groove depth of the recording
- 15   layer of the first recording stack (L0) is in a range from  $0.289 \cdot \lambda / n_s$  to  $0.337 \cdot \lambda / n_s$ .
3. Record carrier according to claim 1, wherein the groove width of the recording layer of the first recording stack (L0) is in a range from  $0.198 \cdot \lambda / NA$  to  $0.397 \cdot \lambda / NA$ , in particular in a range from  $0.289 \cdot \lambda / NA$  to  $0.347 \cdot \lambda / NA$ , where NA is a numerical aperture of
- 20   the radiation beam incident on the optical record carrier.
4. Record carrier according to claim 1, further comprising:
  - at least one additional recording stack between the protective layer and the second recording stack (LN), said additional recording stack comprising a recording layer of
  - 25   an organic dye material and a groove structure and
  - transparent spacer layers sandwiched between the neighboring recording stacks,
- wherein the groove depth of the recording layer of at least one of said additional recording stacks is in a range from  $0.241 \cdot \lambda / n_s$  to  $0.362 \cdot \lambda / n_s$ .

5. Record carrier according to claim 4, wherein the groove depth of the recording layer of at least one of said additional recording stacks is in a range from  $0.289 \cdot \lambda / n_s$  to  $0.337 \cdot \lambda / n_s$ .

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6. Record carrier according to claim 4, wherein the groove width of the recording layers of at least one of said additional recording stacks is in a range from  $0.198 \cdot \lambda / NA$  to  $0.397 \cdot \lambda / NA$ , in particular in a range from  $0.289 \cdot \lambda / NA$  to  $0.347 \cdot \lambda / NA$ .

10 7. Record carrier according to claim 1 or 4, wherein each recording stack further comprises a metal reflective or heat-sink layer arranged on the side of the recording layer facing away from the entrance surface.

15 8. Record carrier according to claim 7, wherein said metal reflective or heat-sink layers are substantially made of a material of the group consisting Ag, Al, Au or Cu.

9. Record carrier according to claim 7, wherein the thickness of said reflective or heat-sink layers is in a range below 40 nm, in particular below 25 nm.

20 10. Record carrier according to claim 1 or 4, wherein the thickness of the recording layer of at least one recording stack at a groove position is in a range from  $0.168 \cdot \lambda / n_r$  to  $0.336 \cdot \lambda / n_r$ , in particular in a range from  $0.235 \cdot \lambda / n_r$  to  $0.302 \cdot \lambda / n_r$ , where  $n_r$  is a refractive index of the recording layer.

25 11. Record carrier according to claim 1 or 4, wherein the recording layer of at least the first recording stack shows a leveling ratio in a range from 0.3 to 0.5, in particular in a range from 0.35 to 0.40, said leveling ratio being defined as the difference between the thickness of said recording layer at a groove position and the thickness of said recording layer at a land position normalized by the groove depth.